

In McNeilly, ozone is not present in the chamber when HF/H<sub>2</sub>O is introduced into the chamber to etch the wafer. Consequently, the HF/H<sub>2</sub>O does not act as a transport medium for the ozone. Also, the HF/H<sub>2</sub>O, which is an etching agent, is not chemically inert to the surface of wafer, as further discussed below.

As shown in FIG. 1 of McNeilly, McNeilly discloses an apparatus 1 in which ozone is introduced into a chamber 2 for pre-cleaning contaminants from a wafer. Following the pre-cleaning step (i.e., after the ozone has reacted with the wafer), the wafer is etched using conventional etching techniques (either vapor phase HF/H<sub>2</sub>O oxide or Cl<sub>2</sub>/UV silicon etching). See col. 2, lines 29-32 and FIG. 1. If vapor phase HF/H<sub>2</sub>O oxide etching is used, the wafer must be cooled to about 20° C to 80° C prior to etching. See col. 12, lines 16-17. McNeilly states that the proper etching “temperature has to be accomplished on a cyclic basis to provide repeatable performance, and must be quickly accomplished to assure high throughput in processing equipment.” See col. 1, lines 56-60. Thus, in order to adequately cool the wafer in the least amount of time, it is implicit that the high temperature ozone is evacuated from the chamber before the etching solution (e.g., HF/H<sub>2</sub>O) is introduced into the chamber.

The Examiner contends that, at col. 4, lines 20-22, McNeilly discloses applying a film of water on a surface of a wafer. This is incorrect. At col. 3, line 59 through col. 4, line 22 of McNeilly, McNeilly describes a classic vapor phase etching procedure, by which a solution of HF/H<sub>2</sub>O is condensed on a wafer surface to etch away material on the wafer. More specifically, col. 4, lines 20-22 of McNeilly states that “anhydrous HF will not generally etch thermal oxide without the addition of H<sub>2</sub>O.” This means that the HF must be applied to the wafer as a solution of HF/H<sub>2</sub>O to carry out etching of the wafer. Thus, McNeilly’s liquid solvent is a solution of HF/H<sub>2</sub>O, not water by itself. Unlike the claimed liquid solvent in Applicant’s invention (which

is inert to the surface of the wafer), the solution of HF/H<sub>2</sub>O is an etching agent that chemically reacts with material on the wafer surface.

Further, the liquid layer of HF/H<sub>2</sub>O in McNeilly cannot serve as a transport medium for the ozone because, as noted above, the ozone is evacuated from the chamber before the HF/H<sub>2</sub>O is introduced into the chamber.

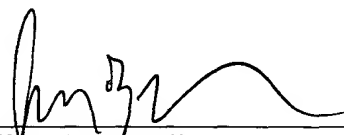
Accordingly, for at least the foregoing reasons, McNeilly does not teach or suggest the apparatus as claimed in the present application. Further, Bachman and McConnell do not make up for the deficiencies of McNeilly. Thus, the rejections of the claims should be withdrawn.

### CONCLUSION

The present application is in condition for allowance and such action is respectfully requested. If any further issues remain concerning this application, the Examiner is invited to call the undersigned to discuss such matters.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By:   
Jeffrey B. Haendler  
Registration No. 43,652

One World Trade Center, Suite 1600  
121 S.W. Salmon Street  
Portland, Oregon 97204  
Telephone: (503) 226-7391  
Facsimile: (503) 228-9446